SAMPLING AND ANALYSIS PLAN/ QUALITY ASSURANCE PROJECT PLAN

Dominguez Channel Oil Spill
Wilmington, California

Prepared for:
U.S. EPA Region IX

Prepared by:
Crimson Pipeline L.P.
2459 Redondo Avenue
Signal Hill, California 90755

May 3, 2011

SAMPLING AND ANALYSIS PLAN/ QUALITY ASSURANCE PROJECT PLAN
Dominguez Channel Oil Spill
Wilmington, California

Table of Contents

APPENDICES

1.0 Introduction

This Sampling and Analysis Plan (SAP) is intended to document the procedural and analytical requirements for the investigation and removal of the Crimson Pipeline crude oil pipeline release that resulted from a crude oil discharge from Crimson Pipeline's 4-in pipeline the "Youngstown Lateral", which connects to the THUMS 8-in pipeline and crosses the ATCA railroad right-of-way north of Pacific Coast Highway in Wilmington, California. This SAP covers the area surrounding the Youngstown Lateral pipeline, the french drain system of the Alameda Corridor Transportation Agency (ACTA) Right-of Way (ROW) and Shell Lube Plant south of the oil pipeline release, and continuing to the storm water collection and treatment system located near the intersection of Leeds Avenue and Grant Street (hereafter referred to as "the Site"). This SAP was prepared by Crimson Pipeline (Crimson), as required by the U.S. Environmental Protection Agency, Region IX (EPA) *Order for Removal, Mitigation or Prevention of a Substantial Threat of Oil Discharge,* EPA docket number CWA 311-9-2011-0002, Section VI, No. 14. In general, the SAP combines the basic elements of a Quality Assurance Project Plan (QAPP) and a Field Sampling Plan (FSP). The following subsections in this introduction provide the site name and location, responsible agencies, and project organization.

The remainder of the SAP includes sections providing reference; data quality objectives (DQOs); sampling rationale; request for analyses; field methods and procedures; sample collection, handling, procedures, sample containers, preservation, and storage; disposal of residual materials; sample documentation and shipment; quality assurance/quality control (QA/QC); field variances; and field health and safety procedures.

1.1 SITE NAME

The Site will be referred to as the "Dominguez Channel Oil Spill". Crude oil from the pipeline lease was discharged into the Dominguez Channel and the City of Los Angeles storm water management system. The discharge of oil into the Dominguez Channel was located approximately 3,000 feet north of the intersection of East Anaheim Street and North Henry Ford Avenue, Wilmington, Los Angeles County, California (the "Site") (see Figure 1 of the Project Plan).

1.2 SITE LOCATION

The Site or spill area includes the area affected by a sheen coming from the Dominguez Channel near Wilmington, California. The Dominguez Channel drains approximately 110 square miles of the Dominguez Watershed and is constructed as rip rap flood control channels near the Site. The Dominguez Channel is an intertidal zone where water from drainages in southern Los Angeles County empties into the East Basin of the Port of Los Angeles and the Pacific Ocean.

1.3 RESPONSIBLE AGENCIES

The EPA is the oversight agency for spill cleanup activities. Other agencies include the California

Department of Fish and Game (CDFG), California Department of Water Resources (CDWR), and California Pipeline Safety Division (CPSD). The Unified Command for this incident is the EPA, CDFG, and Crimson.

1.4 PROJECT ORGANIZATION

The project organization is outlined in the Dominguez Oil Spill Project Plan. Titles/responsibilities, names, and telephone numbers for the immediate EPA, Crimson Managers and its contractors are provided below. Parties involved in the activities described herein, including the EPA, Crimson, and its consultants and contractors are listed in Table 1.

TABLE 1
Key Project Personnel

Title/Responsibility	Contractors	Name	Phone Numbers	
			Office	*Cell*
EPA Project Manager (OSC)		Jason Musante		213-479-2120
Crimson Pipeline VP/Project Coordinator	Crimson Pipeline Management Company	Larry Alexander	562-595-9216	949-922-9895
Project Consultant	Beacon Energy Inc.	Mark Reese P. G.	562-997-3087	714-624-5301
California Department of Fish & Game (OSPR) Lieutenant		Bryan Gollhofer	562- 342-7214	562-708-7757
California Department of Fish & Game (OSPR) Biologist		Cory Kong	562- 342-7214	562-477-7081
California Department of Fish & Game (OSPR)		James Foto	562- 342-7214	562-598-4292
Waste Management Supervisor	WGR Southwest Inc.	Bill Senner	562-799-8510	310-629-5260
Removal Coordinator	WGR Southwest Inc.	Graydon Martz P.G.	562-799-8510	310-629-5261
Project Engineers	Stantec Consulting Corp.	Kevin K. Miskin, P.E.	909-335-6116	909-224-3406
Investigation Coordinator	Stantec Consulting Corp.	Jim DeWoody	909-335-6116	951-403-4623
Quality Assurance (QA) Officer	Stantec Consulting Corp.	James Kerr, P.G.	970-879-3250	303-884-7125
Laboratory QA Officer	Test America Laboratory	Lena Davidkova	949-261-1022	
Environmental Compliance GIS Drafter	Beacon Energy Inc.	Valerie Muller	562-997-3087	310-809-3918

2.0 Background

On December 21, 2010 the discharged oil entered the channel from the outfall of a City of Los Angeles storm water pump station. The oil entered the storm water management system from an outfall of the Alameda Corridor Transportation Agency ("ACTA") railroad right-of-way storm water drainage system. Oil was also observed migrating from the ACTA railroad right-of-way onto the Shell Lube Plant, approximately 0.45 miles up gradient to the north. The discharged oil migrated with storm water into the Shell Lubricants facility storm water retention basin. The flow of oil from the apparent source area is intermittent and related to rain events that cause flow in the storm water systems.

Following initial response actions, the EPA issued an *Order for Removal, Mitigation or Prevention of a Substantial Threat of Oil Discharge,* U.S. EPA docket number CWA 311-9-2011-0002 (hereafter “order”), to guide final cleanup activities at the Site. This SAP was prepared in compliance with the requirements in the order.

2.1 SITE AREA DESCRIPTION

The site is located at Latitude: 33.7825010, Longitude: -118.2372450 in the city of Wilmington, Los Angeles County, California. Land use in the surrounding area is industrial, with refinery facilities and trucking being the main operations. Owners of impacted properties include the City of Los Angeles Department of Public Works Bureau of Sanitation (LA DPW), Shell Lubricants (Shell), and the Alameda Corridor Transportation Authority (ACTA). LA DPW operates a stormwater lift station at the coordinates listed above. Shell operates the Los Angeles Lube Plant, located at 1926 East Pacific Coast Highway. ACTA operates a railroad right-of-way (ROW) that runs through the ports of Long Beach and Los Angeles, primarily along and adjacent to Alameda Street (EPA Dominguez Channel website).

2.2 CONTAMINANTS OF CONCERN – PREVIOUS INVESTIGATIONS

Based on previous investigations of crude oil spill, the general constituents of potential concern (COPC) consist of Total Extractable Petroleum Hydrocarbon (TEPH), Volatile Organic Compounds (VOCs), and Semi Volatile Organic Compounds (SVOCs). The actual COPC will be indentified based on laboratory data provided by the EPA, ACTA and Crimson.

3.0 Project Data Quality Objectives

This section of the SAP describes the procedures by which the accuracy and validity of sample and data generated during the assessment, remediation and post remediation sampling and analysis of soil and surface water will be maintained. The following subsections describe the project task and problem definition, DQs, DQLs, data review and validation, data management, and assessment oversight associated with this project.

3.1 PROJECT TASK AND PROBLEM DEFINITION

The purpose of the SAP is to provide guidance for soils and surface water sampling and analysis in the Site area during the following investigation and contamination removal phases:

Prevent Oil Discharge—Data will be collected to evaluate the limits of impacts resulting from the pipeline spill and to mitigate further discharge from the Site.

Source Removal—Data collected during removal will be used to assess the efficacy and limits of removal actions, segregate impacted and clean media, beneficial reuse and/or recycling of the various affected media.

Post removal confirmation sampling and monitoring— To confirm the efficacy of removal activities data will be required at the completion of remediation operations.

3.2 DATA QUALITY OBJECTIVES (DQOS)

The data quality objectives for this project are to:

- Assess the limits of crude oil impact to soil and surface water
- Assess concentrations of COPCs at levels below applicable relevant and appropriate requirements (ARARs).
- Differentiate concentrations of COPCs above reference levels in soil and surface waters where reference concentrations may exceed applicable regulatory limits.
- Identify chemicals of concern from data collected during the investigation phase of removal actions.
- Evaluate efficacy of removal actions through verification and confirmation sampling.

The precision, accuracy, representativeness, comparability, and completeness (DQIs) of the laboratory data will be assessed to determine the overall quality of the data. The QA objectives for precision, accuracy, and completeness of each measurement parameter are based on prior knowledge of the analytical method, the method validation studies (using replicates, standards, spikes, calibrations, recovery data), and the requirements of the specific project. Definitions of these parameters and the applicable quality control procedures are described below.

3.3 DATA QUALITY INDICATORS (DQIS)

The data will be evaluated against the following parameters:

Precision measures the reproducibility of measurements under a given set of conditions. Specifically, it is a quantitative measure of the variability (precision) of two or more measurements compared to their average values. Precision is calculated from results of duplicate sample analyses. The duplicate samples will consist of one or more of the following: co-located samples, field blind replicates,
analytical laboratory replicate, and/or laboratory instrument replicate. Precision is quantitatively expressed as the relative percent difference (RPD), and is calculated as follows:

RPD = [(C1-C2)/(average of C1 and C2)] x 100

Where:

RPD = relative percent difference
C1 = larger of the two duplicate results
C2 = smaller of the two duplicate results

Laboratory duplicates will be analyzed at a frequency determined by the laboratory as described in Attachment A of the SAP. Field duplicates will be collected at a rate of 5 percent and analyzed for site specific constituents of concern (COCs). The criteria for acceptable precision as determined by laboratory are attached in Attachment A. In addition, Crimson will submit blind duplicate water and soil samples to the laboratory for quantification and comparison. All duplicate samples will be analyzed for site-specific COCs. Following collection of samples for VOC analysis, the soil samples will be homogenized and split in the field for analysis of nonvolatile or extractable constituents.

Accuracy is a measure of the closeness (bias) of the measured value to the true value. The accuracy of test results can be assessed by analyzing a reference material, third party performance evaluation samples, or "spiking" samples in the laboratory with known standards (surrogates or matrix spikes) and determining the percent recovery (%R). The frequency of matrix spike analysis will be determined by the laboratory. The acceptance criterion is specific for the analyte. The %R for the laboratory for each analyte is provided in Attachment A.

Representativeness is a qualitative measure of how closely the measured results reflect the actual concentration or distribution of the constituent concentrations in the matrix sampled. The sampling plan design, sampling collection techniques, sample handling protocols, sample analysis methods, and data review procedures have been developed to assure the results obtained are representative of on-site conditions at the time of sample collection.

Completeness is defined as the percentage of measurements judged to be valid. Results will be considered valid if they are not rejected during data validation (see Page 8). The target completeness goal for this work will be 90 percent for a given analysis.

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared with another. The use of standard regulatory methods and procedures for both sample collection and laboratory analysis will make data collected comparable to both internal and other data generated.

Detection Limits or laboratory reporting limits are specified in the laboratory QA/QC documentation in Attachment A. These limits must be sufficiently low to allow assessment of the data against the DQOs. Where these limits are raised due to matrix or chemical interferences, or elevated concentration, the dilution factor will be documented on the analytical report form.

Data Turn Around Time (TAT) is the time it takes the laboratory to return data to the decision makers from the time that the laboratory receives the data. In order to facilitate the decision making process in the field, the TAT used on this project will not exceed 5 days.

3.4 DATA REVIEW AND VALIDATION

The QA Manager will review the laboratory QA/QC data to determine whether the data meet the above DQO/DQI objectives. In the event that the criteria are not met, the impact to data quality will be evaluated and a determination will be made as to the need for resampling and/or reanalysis. Any data that falls outside the QA/QC criteria or cannot be validated will be flagged in the text and tables.

3.5 DATA MANAGEMENT

Data management will entail the following to ensure accurate transfer of data from collection to analysis:

- Use of standardized forms that include field notes, field data sheets, chain-of-custody forms, and sample labels.
- Proof reading of notes and data as a check against transportation errors.
- Review of field notes and data by the QA Manager for completeness and consistency.
- Review of analytical data by the QA Manager as indicated in Section 3.4 above.
- Review of final report by the Project Manager.

4.0 Sampling Rationale

It is well documented that detectable COPC concentrations exist at the Site in the soil media as a result of other sources unrelated to the Dominguez Spill. Investigation soil samples directly related to the Dominguez Spill will be compared to crude oil samples from the THUMS and Youngstown pipelines. These investigational and crude oil samples will be used to identify the COPCs related to the Dominguez Spill. Soil contamination unrelated to the Dominguez Spill will not be investigated by Crimson. The unrelated contamination results will be forward to the EPA or other regulatory agency, as appropriate.

Crimson will collect and analyze crude oil samples from the Youngstown production which is transported in the Youngstown Lateral pipeline and crude oil from the THUMS 8-inch pipeline. As these oils are cited by the EPA as possible sources of oil in the release, the hydrocarbon “fingerprint” analysis will be used to identify “marker” sources by which comparison will be made.

Soil and water samples will be collected for the purpose of evaluating the limits of crude oil impact, to assess the efficacy of removal operations and to evaluate waste materials for disposal or reuse/recycling, as appropriate.

Investigation sampling will generally be biased high to identify the limits of impact and worst-case conditions, while confirmation and waste characterization samples will be collected randomly and based on statistical testing. The sampling rationale presented herein has as its basic goal the intent of identifying COCs, characterizing areas of concern (AOCs) within the Site where COCs exceed removal goals, and evaluating residual concentrations at the completion of removal activities.

As identified in the Project Plan, general COPCs consist of TEPH, VOCs, and SVOCs. Actual VOC and SVOC analytes of concern will be determined in the investigation phase. To determine which COPCs will be carried forward as COCs, data collected during investigation will be compared to reference concentrations and removal goals. In addition, statistical evaluations will be performed using the methods set forth in EPA SW-846 to evaluate whether a specific COC may be used as a surrogate for cleanup and confirmation of other analytes. Experience has shown at many crude oil sites that TEPH may be used as a surrogate for cleanup for VOCs and SVOCs. The surrogate COC will be selected based on statistical analysis of investigation data. Although a surrogate may be selected to guide removal actions, 10 percent of final confirmation samples will be analyzed for all COCs.

In soil, TEPH will likely be used as the primary surrogate for evaluating removal activities, with secondary criteria based on concentrations of monoaromatics (benzene, toluene, ethylbenzene and total xylenes) and polycyclic aromatic hydrocarbons (PAHs). The removal criteria for TEPH, VOC, SVOCs and monoaromatics are from the regional screening levels (RSLs) published by the EPA Regional IX.

Contaminated soil will be removed that do not jeopardize structural integrity of building, roadways, ACTA railroads, utilities or other assets. The operational goal is the removal of all “free oil” (phase-separated oil) and soil impacted above the Site’s removal goals. The Site removal goal values represented in the Project Plan are for contaminants related to the industrial soil. The proposed quantitative removal goal for TEPH will be 10,000 milligrams per kilogram (mg/kg) in soil. Until such time as TEPH can be established as the surrogate COC for removal activities, the following preliminary removal goals will be used at the Site for aromatics and naphthalene, based on the EPA Region IX RSL.

Benzene	5.4 mg/kg
Toluene	45,000 mg/kg
Total Xylenes	2,700 mg/kg.
Naphthalene	18 mg/kg

Quantification and reporting of TEPH will be full carbon chain ranges of <C12, C13 to C22 and C23 to C44.

Investigation and confirmation sampling and analysis will allow data evaluation consistent with these goals and action levels.

4.1 INVESTIGATION SAMPLES

The objective of investigation as previously stated is to assist in the identification of COCs, identify AOCs, evaluate the extent of impacts in soil and surface water to the degree possible, and to facilitate the selection of removal actions.

During investigation, much of the assessment will be based on visual evidence of oil within the ballast, french drain fabric and gravel pack and entrained in the soil matrix, field PID measurements for VOCs, as well as laboratory sample analyses. Investigation samples will be collected for field assessment and laboratory analyses with the focus on evaluating COPCs and identifying vertical and lateral extent of AOCs where removal action is required.

To assess COPCs a sample of fresh crude oil from the THUMS pipeline, Youngstown pipeline, and a sample of weathered crude oil from the spill area will be collected and analyzed for the following constituents:

Total Extractable Petroleum Hydrocarbons (TEPH-carbon chain)	EPA method 8015B
Volatile Organic Compounds (VOCs)	EPA method 8260B
Semi-VOCs (SVOCs)	EPA method 8270C
CA Title 22 Metals	EPA method 6010B

The results of the fresh crude oil and weathered oil will be compared and submitted under one cover letter. This investigation data will be used to assess COCs (other than TEPH) for removal action. Any analyte exhibiting concentrations above cleanup goals will be added to the COC list for characterization. At this point, COPCs are expected to consist of at least TEPH and BTEX.

The following decisions will be used to guide investigation:

- If liquid oil is encountered, then the area will be designated for removal action of visible oil and free oil entrained in soil.
- Investigation will be guided largely by visual observation and PID readings.
- The quantification and identification of COCs will be determined by collecting a few samples from the Youngstown Lateral, Shell Lube Plant, and/or french drain area. The number of samples collected will be determined in the field and will be based on available video tape information, visual evidence of oil in the ballast material, etc.
- If reported COPC concentrations exceed the removal goal in the deepest or perimeter samples collected at each location, additional step out or deeper samples may be collected to determine the extent of impact. A determination will be made in the field, as to the feasibility and necessity of step out and deeper sampling.

The sample locations will be determined in the field at the time of investigation. All sample locations will be pre-approved by the EPA prior to sampling.

The following paragraphs describe the sample rationale for investigation samples.

4.1.1 Soil Investigation Samples

Soil samples will be collected from safely accessible areas of the railroad right-of-way, the french drain system, and from the areas adjacent to railroad ROW and pipeline. Soil samples will be collected from the french drain system using manual sampling methods that will include spades and hand augers. Additional soil samples may be collected from the railroad ROW and french drain system using other suitable methods. Samples collected for VOC analysis will collected in accordance with EPA method 5035. Soil sample locations will be determined based on visual evidence of gravel impact and previous knowledge of subsurface impact.

The exact locations of soil borings will be determined during the investigation phase and upon review of the video tape from the 8-inch track storm drain system. The following locations along the spill area will be investigated:

Youngstown Lateral Pipeline—as part of the incident investigation, approximately 90 feet of pipeline will be removed in sections of undetermined length dependent upon access provided by the adjacent property owners. Soil excavation and shoring will be required at both ends of the Youngstown Lateral as part of the pipeline removal (Figure 3 of Project Plan). Any impacted soil will be removed from the excavation and disposed of offsite as part of the source removal. Soil samples at each end of the removed pipeline will be advanced to confirm the vertical and lateral limits of impact surrounding the damaged casing. Soil samples will be collected where safely accessible as described below.

- Where visually impacted by crude oil, soil samples will be collected from the sidewalls and bottom of the excavation once the visually impacted soil has been removed. Photo documentation and reference point will be used to identify the location of visual free oil.
- Based on safely concerns, soil samples within the excavation may be collected directly from the bucket of the excavation equipment. One soil sample every 10 linear feet will be collected from the centerline of the excavation.
- One soil samples every 10 linear feet of the perimeter edge will be collected from the sidewall of the excavation.
- Bottom soil samples will be collect 0.5 feet and 3 feet below the visual extent of impact from the excavation (if impact is evident, deeper samples will be attempted).
- Sidewall samples will be collected 0.5 feet and 3 feet beyond the visual extent of impact from the excavation sidewall (if impact is evident, deeper samples will be attempted).
- Sample locations and depths may be modified and will be determined by encountered field conditions.
- Where the bottom or sidewall of the excavation consists of exposed ballast material or gravel, no sample will be collected and a visual assessment will be conducted to ascertain the need for removal based on evidence of free oil.
- All visually impacted soil will be removed to the limit of excavation necessary to install the engineered shoring unless liquid free oil is identified. If free oil is present, the excavation equipment may be used to remove all accessible soil to practical lateral and vertical extent.
- Due to the safely concern associated with the ROW, there exist the possibility that some impacted soil may not be removed or sampled. Approval from EPA and ACTA to leave impacted soil in-situ may be requested based on the location of the soil.

Shell Lube Plant – The Shell Lube Plant property is primarily asphalt pavement (Figure 2 of Project Plan). Confirmation with the Shell Lube Plant has determined that the asphalt surface pavement has been cleaned and is free of any oil. Investigation soil boring in non-asphalt areas will occur if there are indications of impact from crude oil. A Work Activity Plan and recommendations for any future work required in this portion of the project will be provided to EPA upon completion of investigation.

Soil samples will be collected from safely accessible areas of the Shell Lube Plant that present evidence of crude oil contamination. All boring or other sampling locations must be approved in advance of sampling activities by Shell. Soil samples will be collected from the Shell Lube Plant with a Geoprobe direct push type rig or using manual sampling methods that will include spades and hand augers.

Soil sample locations will be determined based on visual evidence of surface impact and previous knowledge of subsurface impact.

- Borings transects will be placed in non-asphalt areas along the flow line of the oil at intervals of approximately 50 feet where safely accessible.
- The center borings within each transect will be placed at the lowest elevation. Step-out borings along each transect will be spaced at approximately 30 feet intervals where visual impact is present.
- Soil samples will be collected 1 foot and 5 feet beyond the visual extent of impact from the boring. If impact is evident, deeper samples will be attempted.
- Due to the safely concern associated with the ROW, some impacted soil may not be removed or sampled. Approval from EPA, Shell, and ACTA to leave impacted soil in-situ may be requested based on the location of the impacted area.

Subsurface conditions will be continuously logged and samples will be collected to confirm the vertical and lateral limits of impact. At least two soil samples will be collected for analyses: one within the contaminated portion of the soil column and one below the visually evident impacts to assess the limits of impact.

French drain system— Areas where blockages of the french drain system were reported in the video tape provided by ACTA will be given priority for inspection by Crimson as part of the free oil recovery (Figure 4 of Project Plan). Impacted ballast material and gravel will be removed as part of the oil removal and investigation. The exact number and locations of blockages along the french drain will be determined from information and video data provided by ACTA. Soil samples along the western and eastern side of the french drain system adjacent to the railroad track will be collected to confirm the vertical limits of impact surrounding the blockage area. Soil samples will be collected as described below only where safely accessible.

- Soil samples will be collected adjacent to the existing french drain and/or utility piping.
- One investigational soil boring will be advanced every 20 feet from the bottom of the french drain system where impact is reported.
- One investigational soil boring will be advanced where known utility laterals intersect the French drain system.

- Soil samples will be collected from 0.5 foot and 2.0 feet at each boring location. If impacts are evident, deeper samples will be attempted.
- Sample locations and depths may be modified and will ultimately be determined by encountered field conditions.
- Where the bottom of the french drain consists of exposed concrete or cemented ballast larger than 2 inches in diameter, no sample will be collected and a visual assessment will be conducted to ascertain the need for removal based on evidence of free oil.
- Due to the safely concern associated with the ROW, some impacted soil may not be removed or sampled. Approval from EPA and ACTA to leave impacted soil in-situ may be requested based on the location of the soil.

4.1.2 Soil Sample Analyses

Depending on the results of the crude oil sample analyses, investigation samples may be analyzed for one or more of the following:

TEPH-full carbon chain	EPA method 8015B
VOCs	EPA method 8260B
SVOCs	EPA method 8270C
CA Title 22 Metals	EPA method 6010B

VOC and SVOC analyses will be selected based on positive TEPH results. No sample will be analyzed for VOCs and SVOCs where TEPH is not detected above laboratory reporting limits. Samples exhibiting higher concentrations of TEPHs will generally be analyzed for VOCs and SVOCs by EPA method 8260B and 8270C, respectively. Soil samples exhibiting higher concentrations of TEPH will generally be analyzed for metals by EPA method 6010B. This soil analysis selection plan will be followed until COC's are confirmed to be below action levels. Approval from the Unified Command System will be requested before analyses are eliminated for the approval SAP.

4.1.3 Surface Water Investigation Samples

It is not anticipated that sampling of surface waters from the Dominguez Channel will be required. However, should it be determined by the Unified Command, that surface water sampling is necessary, surface water samples may be collected from the Dominguez Channel using a weighted clean sample jar or sample dipper. In most cases these jars will be the actual sample jar, with the exception of sample containers containing preservative. For these samples, water contained in a sample jar or sample dipper will be carefully decanted into glass VOAs to minimize turbulence or bottles for preservation and delivery to the laboratory as indicated in subsequent sections.

4.2 CONFIRMATION SAMPLING

Random confirmation sample locations will be selected using the "Locating a Hot Spot" feature in the VSP statistical algorithm. In developing the statistical sampling plan the following were assumed:

Null Hypothesis:	The mean concentration is less than the action level
Alternative Hypothesis:	The mean concentration exceeds the action level.
Confidence Interval:	90 percent
Hot Spot Diameter:	20 feet
Grid Pattern:	Triangular

The Visual Sampling Plan (VSP) software will be used to assess the number of samples required to provide 90 percent confidence that a 20-foot diameter hot spot would not be missed by the confirmation sampling program. Using these assumptions, maps of residual areas of concern (AOC) will be imported into the VSP program to generate random sample locations.

The data collected from the confirmation sampling program will be statistically evaluated to assure that an adequate number of samples are collected and that the data demonstrate a 90 percent confidence level that the mean concentration in the AOC is below the action level. The following errors will be used in the evaluation:

False Rejection error (0.30)
False Acceptance error (0.05)

The following decision statements will guide confirmation sampling.

> If statistical validity is uncertain, then collect additional random samples for analysis. Uncertainty occurs when the null hypothesis is false, but statistical analysis shows that a sufficient number of samples have not been collected.
>
> If the null hypothesis is false, conduct additional removal activity and regenerate random numbers for sample analysis and resample.
>
> If null hypothesis is true, then removal action is complete.

Exceptions to these decision statements may be developed and agreed to by the Unified Command.

The following describe confirmation sampling for each of the potentially affected media.

4.2.1 Soil Confirmation Samples

Soil confirmation samples will be collected from identified AOCs where removal actions are implemented and from removal action staging areas. If removal actions are conducted in the french drain system and Youngstown Lateral pipeline area, confirmation soil samples will be collected from safely accessible areas and will be collected using hand augers at randomly selected locations, otherwise the investigation sample results will be used to document residual impacts remaining in the areas.

Confirmation samples will also be collected from staging or support areas to evaluate potential impacts resulting from removal operations.
Soil sample locations will be determined based on visual inspection and evidence of surface impacts. A grid will be overlaid on each area for sampling at the grid nodes. The size of the grid will depend upon the size and geometry of the removal operations which will be determined in the field and approved by the EPA. Confirmation samples will be collected at 0.5 feet below the french drain system.

Depending on the results of the crude oil sample analyses, confirmation samples may be analyzed for one or more of the following:

TEPH-full carbon chain	EPA method 8015B
VOCs	EPA method 8260B

If possible, the list of analytical methods will be reduced based on investigation data to one surrogate analyte (i.e. TEPH) that will be used to assess the efficacy of cleanup activities. Regardless of whether a surrogate is used to guide removal actions, the two confirmation samples exhibiting the highest concentrations of TEPH in each removal operation area will be analyzed for SVOCs and VOCs. If VOC or SVOC analytes exceed removal goals, all of the confirmation samples will be analyzed for the analyte(s) of concern for statistical evaluation of mean residual concentrations:

4.2.2 Surface Water Confirmation Samples

It is not anticipated that sampling of surface waters from the Dominguez Channel will be required. However, should it be determined by the Unified Command, that surface water confirmation sampling is necessary, surface water confirmation samples will be collected from Dominguez Channel using a weighted clean sample jar or sample dipper. In most cases these jars will be the sample jar, with the exception of sample containers containing preservative. For these samples, water contained in a sample jar will be carefully decanted into glass VOAs or bottles to reduce turbulence for preservation and delivery to the laboratory as indicated in subsequent sections.

Requested surface water samples will be collected from Dominguez Channel for the following list provides project analytes and their associated methods:

TEPH full hydrocarbon chain	EPA method 8015B
VOCs	EPA method 524.2

5.0 Laboratory

Test America Analytical Laboratories, Inc. (Test America) has been selected as the primary analytical laboratory to analyze soil and water samples.

Test America is certified to perform the analyses indicated herein by the California Environmental Laboratory Accreditation Program (ELAP). The QA report, ELAP certifications and most recent audit for Test America are attached in Attachment A.

With approval from the EPA, other laboratories may be used to quantify COPCs depending on the volume of samples generated and the capacity of the laboratory to analyze the samples within hold times or required expedited turn-around time (TAT) or for quality control and confirmation purposes.

6.0 Field Methods and Procedures

The following provide guidance for field methods and procedures that include field equipment; sampling of surface water, sediment and soil; and decontamination.

6.1 FIELD EQUIPMENT

The following provides a list of field equipment and calibration procedures

List of Equipment

Soil
Hand auger (quick disconnect rods with 2 to 4 inch soil bailers)
Hand spades and shovels
Pick axe or pry bars
5-gallon buckets
Cleaning brushes
General health and safety equipment
Sample bottles (4 to 8 ounce glass)
Core samplers
Ice-chilled cooler
PID calibrated to (100 ppmv span gas)
Hand held GPS unit

<u>Water</u>
Sample jars or dippers
5-gallon buckets
General health and safety equipment
Sample bottleware (VOAs, amber glass bottles and plastic bottles) Ice-chilled cooler
Water monitoring equipment
Hand held GPS Unit

Calibration of Field Equipment

Field instruments will be pre-calibrated with calibration performance checks performed on a daily basis. The field PID will be field calibrated to 100 ppm span gas on a daily basis in accordance with the manufacturer's instructions.

The water monitoring equipment will be field calibrated on a daily basis, the dissolve oxygen (DO) and oxygenation reduction potential (ORP) meter will be calibrated using a standard solution prior to performing field measurements. The auto calibration mode of the DO meter calibrates the sensors to factory standards, the Zero value is adjusted at the factory before shipping.

6.2 SAMPLING

During sample collection care will be taken to avoid contact with sampling gloves with the sample media and the interior of the sample container. The following summarizes sampling the methodology for the media, expected to be sampled for during this project.

6.2.1 Soil Sampling

Soil samples collected for vertical characterization of the extent of impact in soil will be sampled using a hand auger or equivalent methods to evaluate the vertical extent of crude oil impact. The hand auger will be manually advanced with downward pressure until the auger is full. At that point, the auger will be removed and the soil will be evaluated for evidence of oil impact. Soil samples will be selected for chemical analysis based on visual evidence of oil discoloration and availability of sufficient quantity to define the extent of impact in the subsurface.

Continuous samples may be collected using a Geoprobe rig or other methods using samplers lined with 1.5- to 2-inch inside diameter clear acetate liners. The sample liner will be split longitudinally for characterization and logging. The entire length of the split core will be scanned with a PID. Samples will be collected for VOC and non-VOC analysis within portions of the core where impacts are evident and from “clean” portions above and below the impact zone to define the extent of impact. VOC samples will be collected using Core Samplers pushed directly into the core and sections of the core will be transferred to 4 to 8 ounce glass jars following the procedures outlined in this SAP.

Based on field observation of subsurface characteristics, samples will be collected at select intervals for measurement of headspace volatile organic vapors using a PID calibrated to 100 ppmv span gas. The following protocols will be followed in taking headspace measurements:

1. Seal sample in a labeled one quart resealable plastic bag (i.e. Ziploc).
2. Manually break up and homogenize the sample
3. Carefully open the corner of the bag and insert tip of the PID into the bag while taking care to seal the bag round the tip with finger tips.
4. Once the reading stabilizes (approximately 5 seconds), record the PID reading as ppmv.

All borings or sample points will be continuously sampled and logged.

Samples for analysis of nonvolatile components will be discharged directly from the bailer into 4 to 8 ounce jars and hand packed to remove dead air headspace and sealed with a Teflon-lined screw cap lid.

Samples for VOC analysis will be collected in accordance with EPA method 5035 (using Core samplers). Each Coring Sampler will be collected from the sidewall of the boring/excavation, from the end of a core or tube sample, from the bottom of the hand auger bailer or from the bottom of the spade where the freshest sample is generally located. The Core Samplers will be collected in such a manner as to avoid contact with the hand auger or spade. A minimum of 3 Core Samplers will be collected from each sample point. The Core Samplers will be sealed with the provided caps, labeled, placed in labeled Ziploc bags and stored in an ice-chilled cooler for transport to the laboratory.

6.2.2 Water Samples

If surface water samples are required, samples will be collected from the upper 0.5 feet of the channel using a weighted sample jar or dip. The jar or dip will be completely submerged to allow sampling below the air water interface. Where insufficient surface water exists in the wash, shallow wells will be excavated prior to sampling and the water will be allowed to clear before sampling. Where sufficient water exists, samples will be collected directly into the sample bottle, unless the bottle or VOA contains preservative. All bottles will be pre-preserved by the laboratory or supplier. For samples in preserved bottles or VOAs, the sample will be carefully decanted from a sampling jar or dipper directly into the sample bottle/VOA by carefully pouring the sample down the side of the sample jar (held at an angle) to reduce turbulence to prevent volatilization of any potential volatile fractions.

At each sampling location, all bottles designated for a specific analysis (e.g., VOCs) will be filled sequentially before bottles designated for the next analysis are filled (e.g., SVOCs). If a duplicate sample is to be collected at this location, all bottles designated for analysis for both sample designations will be filled sequentially before bottles for another analysis are filled. Where multiple bottles are required for a given set of analyses, duplicate samples will be collected from alternating filled bottles. For example, if 3 bottles are required for a given set of analyses and duplicate analyses are also scheduled (total of 6 bottles to be filled), bottles 1, 3 and 5 would be used as the original sample set and bottles 2, 4 and 6 would be used for duplicate analysis.

Water samples will be transferred from the discharge tube or outlet directly into the appropriate sample containers with preservative (if required), chilled, and processed for shipment to the laboratory. When transferring samples, care will be taken not to touch the lip or interior of the sample container to avoid artifact contamination.

Vials for VOC analysis (VOAs) will be filled first to minimize the effect of aeration on the water sample. The vials will be filled to prevent air bubbles and capped. The vial will be inverted and checked for air bubbles to ensure zero headspace. If a bubble greater than 6 mm in diameter appears in the VOA, the VOA will be discarded and a new sample will be collected in a fresh VOA.

Samples collected in amber glass bottles (two 500 ml bottles) for analysis of TEPH will also be preserved with HCl. All sample containers will supplied by the laboratory with the required perseverates. All samples will be stored in an ice-filled cooler for transport to the laboratory.

6.3 DECONTAMINATION

The decontamination procedures that will be followed are in accordance with approved EPA procedures. Decontamination of sampling equipment must be conducted consistently as to assure the quality of samples collected. All equipment that comes into contact with the sample media will be decontaminated. Disposable equipment intended for one-time use will be packaged for appropriate disposal. Decontamination will occur prior to and after each use of a piece of equipment. All sampling devices used will be decontaminated according to the following procedure:

Tap water and nonphosphate detergent wash using a brush or scrubber
Tap water rinse
Deionized/distilled water rinse

All cleaned materials shall be stored in manner to prevent contact with potentially contaminated media using plastic bags or by being placed upright in clean buckets or other containers. Materials to be stored more than a few hours will also be covered.

Decontamination fluids will be discharged to skim ponds or other approved areas where removal activities are ongoing.

7.0 Sample Containers, Preservation, and Storage

Proper sample container will be obtained from the laboratory prior to field operations. Sample containers used will be pre-cleaned and will not be rinsed prior to sample collection. Preservatives, if required, will be added by the laboratory or supplier prior to shipment to the field. The following subsections provide a discussion concerning containers, preservation, and storage for each type of analysis. Table D-2 summarizes requirements for containers, preservation and hold times.

7.1 VOLATILE ORGANIC COMPOUNDS AND TEPH

Soil

Samples for VOCs will be collected in accordance with EPA method 5035. The sample will be contained in Core Sampler containers. A total of three Core Sampler containers will be collected at each sample point prior to agitation. Each Core Sampler will be sealed with the provided cap until it snaps into place. Each sample will be sealed in the resealable pouch, labeled and place in an ice-filled cooler at <4°C.

For TEPH, soil samples will be contained in hand packed 4 to 8-ounce glass jars or 6-inch brass or stainless steel sample tubes. The top of the container will be struck off level to preclude headspace. Glass jars will be sealed with a Teflon-lined screw cap lid, while tube samples will be capped on each end with a Teflon sheet followed by tight-fitting plastic caps sealed with non-VOC tape. The sample will be preserved in an ice-chilled cooler at <4°C.

Water

Water samples for TEPH will be collected in 500 milliliter (mL) amber glass bottles pre-preserved by the laboratory with HCl (pH<2). Two bottles will be collected at each sample location. The bottles will be filled to allow the water to mound over the top of the bottle and then sealed with the screw cap lid to preclude any air bubbles or headspace. Once the bottles are sealed and labeled, the bottles will be stored in an ice-filled cooler for transport to the laboratory at <4°C.

Water samples to be analyzed for volatile organic compounds will be collected in three 40 mL glass VOAs preserved by the laboratory with 1:1 HCl (pH<2). The vials will be filled to allow the water to mound over the top of the VOA and capped to remove any headspace. The samples will be chilled to 4°C immediately following collection in an ice-chilled cooler. Three VOAs will be required for analysis of VOCs from each water sample location.

7.2 SEMI VOLATILE ORGANIC COMPOUNDS

Soil

Soil samples will be contained in hand packed 4 to 8-ounce glass jars or 6-inch brass or stainless steel sample tubes. The top of the container will be struck off level to preclude headspace. Glass jars will be sealed with a Teflon-lined screw cap lid, while tube samples will be capped on each end with a Teflon sheet followed by tight-fitting plastic caps sealed with non-VOC tape. The sample will be preserved in an ice-filled cooler at <4°C. The container used for TEPH analysis may also be used for SVOC analysis.

Water

Water samples for SVOC analysis will be contained in 1-liter amber bottles Supplied by the laboratory. Two bottles will be collected at each sample location. The bottles will be filled to allow the water to mound over the top of the bottle and then sealed with the screw cap lid to preclude any air bubbles or headspace. Once the bottles are sealed and labeled, the bottles will be stored in an ice-chilled cooler for transport to the laboratory at <4°C.

8.0 Disposal of Residual Materials

In the process of collecting environmental samples, several different types of potentially contaminated waste will be generated including:

Used personal protective equipment (PPE)
Disposable sampling equipment
Decontamination fluids

The following subsections describe management of used PPE and decontamination fluids.

8.1 USED PPE AND DISPOSABLE EQUIPMENT

Used PPE and disposable equipment will be double bagged and discarded as described in Section 4.0.

8.2 DECONTAMINATION FLUIDS

Decontamination fluids that will be generated in the sampling event will consist of deionized and tapwater rinsate with dilute residual contaminants. The volume and concentration of the decontamination fluid will be sufficiently low to allow disposal at the site or sampling area. The water will be managed as discussed in Section 4.0.

9.0 Sample Documentation and Shipment

The following subsections provide details concerning sample documentation and shipping procedures including field notes, labeling, chain-of-custody, custody seals, and packaging and shipment.

9.1 FIELD NOTES

Because sampling situations vary widely, field notes will be as descriptive and inclusive as possible; anyone reading the entries should be able to reconstruct the sampling situation from the recorded information. Language within field notes will be objective, factual, and free of inappropriate or ambiguous terminology. All field personnel are to date and sign any data entries. All field documentation will be retained.

Sampling field data sheets include information on specific activities related to collection of a single sample. The sampling field data sheets will be completed in the field at the time of the sample collection by the sampling personnel. A Sampling Field Data Sheet is provided in Attachment B.

The field data recorded at the time of sample collection provides unambiguous identification of each sample. At a minimum, the following information will be recorded during the collection of each sample:

- Sample location (GPS unit coordinates, depth (in feet) and description)
- Site or sampling area sketch showing sample location and measured distances or GPS coordinates.
- Sampler's name
- Date and time of sample collection
- Designation of sample as composite or grab
- Type of sample
- Type of sampling equipment used
- Field instrument readings and calibration
- Field observations and details related to analysis or integrity of sample
- Preliminary sample descriptions
- Sample preservation
- Lot numbers of the sample containers, sample identification numbers and any explanatory codes, and chain-of-custody form numbers

In addition to the sampling information, the following specific information will also be recorded in the field notes:

- Time of arrival/entry on site and time of site departure
- Other personnel on site
- Summary of any meetings or discussions with tribal, contractor, or federal agency personnel
- Procedural deviations and/or personnel changes
- Calibration records

9.2 LABELING

All samples collected will be labeled in a clear and precise way for proper identification in the field and for tracking in the laboratory. The samples will have preassigned, identifiable, and unique sample I.D. numbers. At a minimum, the sample labels will contain the following information in indelible ink: sample I.D., sample location, date of collection, analytical parameter(s), and method of preservation.

Each sample will be given a unique sample I.D. number for reference on maps, chain of custody documentation and field logs. The I.D. will designate whether the general location of the sample, the media sampled and a unique number identifying the sample location and depth. The nomenclature for each sample will be identified as follows:

ZV-XXY-ABB-CC

Where:

Z = Activity Phase
'N' for Investigation phase
'C' for confirmation phase

V = Duplicate sample
If sample is a field duplicate the letter 'R' or 'V' will be inserted. Otherwise this space is left blank.

X = General Location
'YL' for Youngstown Lateral
'FD' for French Drain
'SD' for Storm Drain Collection
'SL' for Shell Lube Plant
'DC' for Dominguez Channel

Y = Media
'W' for water

'S' for soil

A = Sample Point Type
'T' for transect
'H' for hand auger
'G' for grab sample
'B' for boring sample

BB = Unique transect, or boring number (i.e. 01, 02….10, 11, etc.)

CC = Sample depth (i.e. 0.5, 2.5, 5.0 feet, etc.)

Trip blanks and equipment blanks will be labeled with the nomenclature of Z-XX-Y-AABBCC. Where:

Z = Activity Phase
N for investigation
C for confirmation

Y = Media
W for water or aqueous sample

AABBCC = Sample Date
AA = month, BB = day, and CC = year of sample collection

9.3 CHAIN-OF-CUSTODY

Chain-of-custody record forms are used to document sample collection and shipment to laboratories for analysis. All sample shipments for analyses will be accompanied by a chain-of-custody record. A copy of the form is found in Attachment C. Form(s) will be completed and sent with the samples for each shipment. Proper distribution of the forms is found in the *Instructions for Sample Shipping and Documentation* guidance document. If multiple coolers are sent to a single laboratory on a single day, form(s) will be completed and sent with the samples for each cooler.

The chain-of-custody form will identify the contents of each shipment and maintain the custodial integrity of the samples. Generally, a sample is considered to be in someone's custody if it is either in someone's physical possession, in someone's view, locked up, or kept in a secured area that is restricted to authorized personnel. Until the samples are shipped, the custody of the samples will be the responsibility of the sampler. The sampling team leader or designee will sign the chain-of-custody form in the "relinquished by" box and note date, time, and air bill number. The sample numbers for all rinsate samples, reference samples, laboratory QC samples, and duplicates will be documented on this form (see Section 10.0). A copy will be retained in the master files.

9.4 PACKAGING AND SHIPMENT

All sample containers will be placed in a strong-outside shipping container (a steel-belted cooler). The following outlines the packaging procedures that will be followed for low concentration samples:

1. When ice is used, pack it in zipper-locked, double plastic bags. Seal the drain plug of the cooler with fiberglass tape to prevent melting ice from leaking out of the cooler.
2. The bottom of the cooler should be lined with bubble wrap to prevent breakage during shipment.
3. Check screw caps for tightness and, if not full, mark the sample volume level of liquid samples on the outside of the sample bottles with indelible ink.
4. Secure bottle/container tops with clear tape and custody seal all container tops.
5. Affix sample labels onto the containers with clear tape.
6. Wrap all glass sample containers in bubble wrap to prevent breakage.
7. Seal all sample containers in heavy duty plastic zipper-lock bags. Write the sample numbers on the outside of the plastic bags with indelible ink.
8. Place samples in a sturdy cooler(s) lined with a large plastic trash bag. Enclose the appropriate chain-of-custody forms in a zipper-lock plastic bag affixed to the underside of the cooler lid.
9. Fill empty space in the cooler with bubble wrap or Styrofoam peanuts to prevent movement and breakage during shipment.
10. Ice used to cool samples will be double sealed in two zipper-lock plastic bags and placed on top and around the samples to chill them to the correct temperature.
11. Each ice chest will be securely taped shut with fiberglass strapping tape and custody seals will be affixed to the front, right and back of each cooler. Records will be maintained by the project sample custodian with the following information:
    - Name and location of the site or sampling area
    - Total number(s) by estimated concentration and matrix of samples shipped
    - Carrier, air bill number(s), method of shipment
    - Shipment date and when it should be received by lab
    - Irregularities or anticipated problems associated with the samples
    - Whether additional samples will be shipped or if this is the last shipment.

10.0 Quality Control

The following subsections discuss collection and analysis of quality control samples including field quality control and laboratory quality control samples.

10.1 FIELD QUALITY CONTROL SAMPLES

Field quality control samples are intended to help evaluate conditions resulting from field activities and are intended to accomplish two primary goals: (1) assessment of field contamination (equipment blanks) and (2) assessment of sampling variability (duplicate samples). The former identifies substances introduced in the field due to environmental or sampling equipment and are assessed using blanks of different types. The latter includes variability due to sampling technique and instrument performance as well as variability possibly caused by the heterogeneity of the matrix being sampled and is assessed using replicate sample collection. The following sections cover field QC.

10.1.1 Equipment Blanks

Equipment blanks will be collected in lieu of field blanks as they provide the best overall means of assessing contamination arising from the equipment, ambient conditions, sample containers, transit, and the laboratory. One equipment rinsate blank will be collected per day that sampling equipment is decontaminated in the field. Equipment rinsate blanks will be obtained by passing deionized water through or over the decontaminated sampling devices used that day. The rinsate blanks that are collected will be analyzed for VOCs, SVOCs, TEPH. The equipment rinsate blanks will be preserved, packaged, and sealed in the manner described for the environmental samples.

10.1.2 Temperature Blanks

For each cooler that is shipped or transported to an analytical laboratory, a 40-mL VOA vial or pre-manufactured temperature blank will be included that is marked “temperature blank.” This blank will be used by the laboratory sample receiver to check the temperature of samples upon receipt.

10.1.3 Travel Blanks

One travel or trip blank will be submitted for VOC analysis with each cooler containing sample requiring VOC analyses. Trip blanks are supplied by the laboratory with the sampling containers at the start of field activities and accompany the sample containers throughout the project.

10.1.4 Assessment of Field Variability (Field Duplicate Samples)

Field duplicate samples will be collected from water, soil and sediment samples at a rate of 5 percent or one in 20 samples. VOC duplicates will be collected prior to agitation. Once the VOC samples are collected, the soil and sediment samples designated for field duplication will be thoroughly homogenized in a sealed plastic bag (VOCs) or in another clean container. The sample will then be split for duplicate sampling.

When collecting duplicate water samples, bottles with the two different sample identification numbers will alternate in the filling sequence. Note that bottles for one type of analysis will be filled before bottles for the next analysis are filled. Samples for volatiles will always be filled first.

Duplicate samples will be preserved, packaged, and sealed in the same manner as other samples of the same matrix. A separate sample number and station number will be assigned to each duplicate, and it will be submitted blind to the laboratory. Field duplicates will be identified in the field log book.

10.2 LABORATORY QUALITY CONTROL SAMPLES

Laboratory QC samples are analyzed as part of standard laboratory practice. The laboratory monitors the precision and accuracy of the results of its analytical procedures through analysis of QC samples. In part, laboratory QC samples consist of matrix spike/matrix spike duplicate samples for organic analyses, and matrix spike and duplicate samples for inorganic analyses.

11.0 Field Variances

As conditions in the field may vary, it may become necessary to implement minor modifications to sampling as presented in this plan. Also, as conditions are revealed and AOCs are better defined, modifications are expected with respect to confirmation sampling locations, etc. The EPA OSC will be notified and a verbal approval will be obtained before implementing the changes. Modifications to the approved plan will be documented in the sampling project report.

12.0 Field Health and Safety Procedures

A site specific health and safety plan (HASP) has been developed for this project under separate cover.

ATTACHMENT A

Appendix 3. Laboratory Certifications, Accreditations, Validations

The Irvine and Ontario laboratories maintain certifications, accreditations, certifications, and validations with various state and national entities. Programs vary but may include on-site audits, reciprocal agreements with another entity, performance testing evaluations, review of the QA Manual, Standard Operating Procedures, Method Detection Limits, training records, etc. At the time of this QA Manual revision, the laboratory has accreditation/certification/licensing with the following organizations:

IRVINE FIXED LABORATORY (CA01531)			
State	**Agency**	**Program**	**License Number**
CA	CDPH-NELAP	DW, WW, HW	01108CA
CA	CDPH-ELAP	HW	2706
AZ	DHS	DW, WW, HW	AZ0671
NV	DEP	DW, WW, RCRA	CA015312009A
HI	DOH	DW	--
CNMI	DEQ	DW	MP002
GUAM	EPA	DW	10-001r
NM	DWB	DW	--
--	CSDLAC	WW	10256
--	USDA	Foreign Soil	P330-09-00080
--	EPA	ERLN/Water Laboratory Alliance (WLA)	--

IRVINE MOBILE LABORATORY #3 (CA01473)			
State	**Agency**	**Program**	**License Number**
CA	CDPH-ELAP	WW, HW	2678

ONTARIO SERVICE CENTER (CA01533)			
State	**Agency**	**Program**	**License Number**
CA	CDPH-ELAP	DW, WW [micro only]	2696

The certificates and parameter lists (which may differ) for each organization may be found on the corporate web site, the laboratory's public server, the final report review table, and in the following offices: QA, marketing, and project management.

Appendix 4 Laboratory Capabilities

Program	Analyte Group	Technique	Method	Source	Description
Drinking Water	Bacteriological	Microbiology	9215B	Std. Methods	Heterotrophic bacteria (Pour Plate Method)
Drinking Water	Bacteriological	Microbiology	9221 B	Std. Methods	E. Coli
Drinking Water	Bacteriological	Microbiology	9221 B	Std. Methods	Coliforms, Total by MTF (MPN)
Drinking Water	Bacteriological	Microbiology	9221 D	Std. Methods	Coliforms Fecal (Presence/Absence)
Drinking Water	Bacteriological	Microbiology	9221 E	Std. Methods	Fecal Coliforms by MTF
Drinking Water	Bacteriological	Microbiology	9221A	Std. Methods	Coliforms, Total - Fermentation Technique
Drinking Water	Bacteriological	Microbiology	9221A	Std. Methods	Coliforms, Total - Enumeration
Drinking Water	Bacteriological	Microbiology	9223B	Std. Methods	Total Coliforms
Drinking Water	Bacteriological	Microbiology	9223B	Std. Methods	E. Coli
Drinking Water	Bacteriological	Microbiology	SIMPLATE	IDEXX	Heterotrophic Bacteria
Drinking Water	Diquat/paraquat	HPLC	549.2	EPA	Diquat/paraquat
Drinking Water	EDB/DBCP	GC/ECD	504.1	EPA	DBCP & EDB
Drinking Water	General Chemistry	Turbidimetric	180.1	EPA	Turbidity
Drinking Water	General Chemistry	Ion Chromatography (IC)	300.0	EPA	Anions, by IC (Br, PO4, SO4, NO3, NO2,Cl, F)
Drinking Water	General Chemistry	Ion Chromatography (IC)	300.1	EPA	Bromate,Chlorite,Chlorate,Bromide
Drinking Water	General Chemistry	Titrimetric	310.1	EPA	Alkalinity, (Total, bicarb, carb, hydrox)
Drinking Water	General Chemistry	Spectrophotometric	330.5	EPA	Chlorine Residual
Drinking Water	General Chemistry	General Chemistry	2120 B	Std. Methods	Color
Drinking Water	General Chemistry	Turbidimetric	2130 B	Std. Methods	Turbidity
Drinking Water	General Chemistry	General Chemistry	2150 B	Std. Methods	Odor
Drinking Water	General Chemistry	Titrimetric	2320 B	Std. Methods	Alkalinity, Hydroxide
Drinking Water	General Chemistry	Titrimetric	2320 B	Std. Methods	Alkalinity, Total
Drinking Water	General Chemistry	Titrimetric	2320 B	Std. Methods	Alkalinity, Carbonate
Drinking Water	General Chemistry	Titrimetric	2320 B	Std. Methods	Alkalinity, Bicarbonate
Drinking Water	General Chemistry	Calculation	2330A+B	Std. Methods	Corrosivity (Langlier Index)
Drinking Water	General Chemistry	Calculation	2340 B	Std. Methods	Hardness (by calculation)
Drinking Water	General Chemistry	Potentiometric	2510 B	Std. Methods	Conductance, Specific
Drinking Water	General Chemistry	General Chemistry	2550 B	Std. Methods	Temperature
Drinking Water	General Chemistry	Spectrophotometric	4500-CN C E	Std. Methods	Cyanide, Total (includes distillation method)
Drinking Water	General	Spectrophotometric	4500-CN E	Std.	Cyanide, Total (Colorimetric-Spec)

Program	Analyte Group	Technique	Method	Source	Description
	Chemistry			Methods	
Drinking Water	General Chemistry	Automated, Colorimetric	4500-CN G	Std. Methods	Cyanide, Total (Automaed Color. or Spec)
Drinking Water	General Chemistry	Spectrophotometric	4500-CN G	Std. Methods	Cyanide, Amenable to Chlorination
Drinking Water	General Chemistry	Potentiometric	4500-F C	Std. Methods	Fluoride (probe)
Drinking Water	General Chemistry	Potentiometric	4500-F C	Std. Methods	Fluoride
Drinking Water	General Chemistry	Potentiometric	4500-H+B	Std. Methods	pH
Drinking Water	Glyphosate	HPLC	547	EPA	Glyphosate
Drinking Water	Haloacetic Acids (HAAs)	GC/ECD	552.2	EPA	Haloacetic Acids (HAAs)
Drinking Water	Herbicides	GC/ECD	515.4	EPA	Chlorinated Acids
Drinking Water	Metals	Calculation	200.7	EPA	Hardness (calculation from ICP results)
Drinking Water	Metals	Digestion	200.7	EPA	Digestion, Metals - Total Recoverable for ICP
Drinking Water	Metals	ICP	200.7	EPA	Silica
Drinking Water	Metals	Digestion	200.9	EPA	Digestion, Metals - Total Recoverable for Graphite Furance
Drinking Water	Metals	GFAA	200.9	EPA	Metals, Graphite Furnace
Drinking Water	Metals	CVAA	245.1	EPA	Mercury, CVAA
Drinking Water	Perchlorate	IC/MS	332.0	EPA	Perchlorate
Drinking Water	Pesticides	GC/ECD	508.1	EPA	Pesticides
Drinking Water	Pesticides	HPLC	531.1	EPA	Carbamates
Drinking Water	Pesticides	GC/MS	548.1	EPA	Endothall
Drinking Water	Pesticides / PCBs	GC/ECD	505	EPA	Pesticides / PCBs
Drinking Water	Semivolatile Organics	GC/MS	525.2	EPA	Semivolatiles
Drinking Water	Volatile Organics	GC/Microextraction	504.1	EPA	EDB/DBCP/TCP
Drinking Water	Volatile Organics	GC/MS	524.2	EPA	Volatiles, Drinking Water
Drinking Water	Volatile Organics	GC/MS	524.2	EPA	Tentatively Identified Compounds (TICs)
Drinking Water	Volatile Organics	GC/MS	CA SRL 524M-TCP	California DHS	1,2,3-Trichloropropane
Solid & Hazardous Waste	BTEX	GC/FID	8021B	SW-846	BTEX
Solid & Hazardous Waste	Extractable Organics	Extraction	3510C	SW-846	Extraction, Separatory Funnel Liquid-Liquid
Solid & Hazardous Waste	Extractable Organics	Extraction	3520C	SW-846	Extraction, Continuous Liquid-Liquid
Solid & Hazardous Waste	Extractable Organics	Extraction	3550B	SW-846	Extraction, Ultrasonic
Solid & Hazardous Waste	Extractable Organics	Extraction	3580A	SW-846	Extraction, Waste Dilution
Solid & Hazardous Waste	Extractable Organics	Clean-Up	3620B	SW-846	Florisil Cleanup
Solid & Hazardous Waste	Extractable Organics	Clean-Up	3650B	SW-846	Acid-Base Partition Cleanup
Solid & Hazardous Waste	Extractable Organics	Clean-Up	3660B	SW-846	Sulfur Cleanup
Solid & Hazardous Waste	Extractable Organics	Clean-Up	3665A	SW-846	Sulfuric Acid/Permanganate Cleanup

Program	Analyte Group	Technique	Method	Source	Description
Solid & Hazardous Waste	General Chemistry	Spectrophotometric	9014	SW-846	Cyanide, Total
Solid & Hazardous Waste	General Chemistry	Spectrophotometric	9014	SW-846	Cyanide, Amenable to Chlorination
Solid & Hazardous Waste	General Chemistry	Titrimetric	9034	SW-846	Sulfide, Acid Soluble & Insoluble Forms
Solid & Hazardous Waste	General Chemistry	Ion Chromatography (IC)	9056	SW-846	Anions, by IC (Br, PO4, SO4, NO3, NO2,Cl, F)
Solid & Hazardous Waste	General Chemistry	IR	9060	SW-846	Total Organic Carbon (TOC)
Solid & Hazardous Waste	General Chemistry	Spectrophotometric	9065	SW-846	Phenols, Total
Solid & Hazardous Waste	General Chemistry	Potentiometric	9214	SW-846	Fluoride (distillation probe)
Solid & Hazardous Waste	General Chemistry	Pensky Martens Closed Cup	1010 A	SW-846	Ignitability
Solid & Hazardous Waste	General Chemistry	Digestion	3060 A	SW-846	Digestion, Alkaline for Hexavalent Chromium
Solid & Hazardous Waste	General Chemistry	Spectrophotometric	9010 B	SW-846	Cyanide, Total (prep only)
Solid & Hazardous Waste	General Chemistry	Spectrophotometric	9012 B	SW-846	Cyanide, Total
Solid & Hazardous Waste	General Chemistry	Distillation	9030B	SW-846	Sulfide (Distillation)
Solid & Hazardous Waste	General Chemistry	Potentiometric	9040B	SW-846	Corrosivity, as pH
Solid & Hazardous Waste	General Chemistry	Potentiometric	9045C	SW-846	pH, Solid & Waste
Solid & Hazardous Waste	General Chemistry	Potentiometric	9050A	SW-846	Specific Conductance
Solid & Hazardous Waste	General Chemistry	General Chemistry	9095A	SW-846	Paint Filter Test
Solid & Hazardous Waste	General Chemistry	Ion Chromatography (IC)	314.0	EPA	Perchlorate
Solid & Hazardous Waste	Hydrocarbons	Gravimetric	1664 A	EPA	Oil & Grease & Petroleum Hydrocarbons
Solid & Hazardous Waste	Hydrocarbons	GC/FID	8015AZ R.1	Arizona DHS	C10 - C32 Hydrocarbons
Solid & Hazardous Waste	Hydrocarbons	GC/FID	8015B_DRO	SW-846	Diesel Range Organics (DRO)
Solid & Hazardous Waste	Hydrocarbons	GC/FID	8015B_GRO	SW-846	Gasoline Range Organics (GRO)
Solid & Hazardous Waste	Hydrocarbons	GC/FID	8015D_DRO	SW-846	Diesel Range Organics (DRO)
Solid & Hazardous Waste	Hydrocarbons	GC/FID	8015D_GRO	SW-846	Gasoline Range Organics (GRO)
Solid & Hazardous Waste	Hydrocarbons	Gravimetric	9071B	SW-846	Oil & Grease (Gravimetric)
Solid & Hazardous Waste	Hydrocarbons	GC/FID	CA LUFT	CA LUFT	Diesel Range Organics (DRO) CA LUFT
Solid & Hazardous Waste	Leach	TCLP	1311	SW-846	TCLP, Toxicity Characteristic Leachate Procedure
Solid & Hazardous Waste	Leach	SPLP	1312	SW-846	Synthetic Precipitate Leachate Procedure
Solid & Hazardous Waste	Metals	ICP/MS	6020	SW-846	Metals, ICP-MS Analysis
Solid & Hazardous Waste	Metals	Ion Chromatography (IC)	7199	SW-846	Chromium, Hexavalent
Solid & Hazardous Waste	Metals	ICP	9081	SW-846	Cation Exchange Capacity (Sodium Acetate)

Program	Analyte Group	Technique	Method	Source	Description
Solid & Hazardous Waste	Metals	Digestion	3005 A	SW-846	Digestion, Metals - Waters/Dissolved/Total Rec. for FLAA & ICP
Solid & Hazardous Waste	Metals	Digestion	3010 A	SW-846	Digestion, Metals - Aqueous Samples & Extracts
Solid & Hazardous Waste	Metals	Digestion	3020 A	SW-846	Digestion, Metals for Graphite Furance
Solid & Hazardous Waste	Metals	Digestion	3050 B	SW-846	Digestion, Metals - Sediments, Sludges & Soils
Solid & Hazardous Waste	Metals	General Chemistry	6010B	SW-846	Silica
Solid & Hazardous Waste	Metals	ICP	6010B	SW-846	Metals
Solid & Hazardous Waste	Metals	Spectrophotometric	7196A	SW-846	Chromium, Hexavalent
Solid & Hazardous Waste	Metals	CVAA	7470A	SW-846	Mercury in Liquid Waste
Solid & Hazardous Waste	Metals	CVAA	7471A	SW-846	Mercury in Solid or Semisolid Waste
Solid & Hazardous Waste	Metals	GFAA	HML-939-M	CA DTSC	Organo Lead
Solid & Hazardous Waste	PCBs	GC/ECD	8082	SW-846	PCBs
Solid & Hazardous Waste	Pesticides	GC/ECD	8081A	SW-846	Organochlorine Pesticides
Solid & Hazardous Waste	Semivolatile Organics	Extraction	3545	SW-846	Extraction, Pressurized Fluid
Solid & Hazardous Waste	Semivolatile Organics	GC/MS	8270C	SW-846	Semivolatiles
Solid & Hazardous Waste	Semivolatile Organics	GC/MS	8270C	SW-846	PAHs GC/MS Scan Low Level
Solid & Hazardous Waste	Semivolatile Organics	GC/MS	8270C SIM	SW-846	PAHs GC/MS SIM Low Level
Solid & Hazardous Waste	Volatile Organics	Purge and Trap	5035	SW-846	Closed System Purge and Trap for Soils and Waste
Solid & Hazardous Waste	Volatile Organics	Purge and Trap	5030B	SW-846	Purge and Trap for Aqueous Samples
Solid & Hazardous Waste	Volatile Organics	GC/FID	8015B_DAI	SW-846	Alcohols
Solid & Hazardous Waste	Volatile Organics	GC/FID	8021B	SW-846	BTEX and GRO (Plus MTBE)
Solid & Hazardous Waste	Volatile Organics	GC/MS	8260B	SW-846	Volatiles
Solid & Hazardous Waste	Volatile Organics	GC/MS	8260B SIM	SW-846	Volatiles, SIM Low-Level GC/MS
Solid & Hazardous Waste	Waste Characterization	Waste Characterization	1010	SW-846	Flashpoint, Pensky-Martens
Solid & Hazardous Waste	Waste Characterization	Waste Characterization	1010	SW-846	Ignitability, Pensky-Martens
Solid & Hazardous Waste	Waste Characterization	Waste Characterization	SW 7.1.2	SW-846	Ignitability, Solids/Wastes
Wastewater	Bacteriological	Microbiology	9215B	Std. Methods	Heterotrophic Bacteria (Pour Plate Method)
Wastewater	Bacteriological	Microbiology	9221 B	Std. Methods	Coliforms, Total by MTF (MPN)
Wastewater	Bacteriological	Microbiology	9221 E	Std. Methods	Fecal Coliforms by MTF
Wastewater	Bacteriological	Microbiology	9221 F	Std. Methods	E. Coli
Wastewater	Bacteriological	Microbiology	9221C	Std.	Coliforms, Fecal

Program	Analyte Group	Technique	Method	Source	Description
				Methods	
Wastewater	Bacteriological	Microbiology	9223B	Std. Methods	E. Coli
Wastewater	Bacteriological	Microbiology	9230B	Std. Methods	Enterococci
Wastewater	Bacteriological	Microbiology	9230B	Std. Methods	Enterococci
Wastewater	Bacteriological	Microbiology	9230B	Std. Methods	Fecal Streptococci
Wastewater	Bacteriological	Microbiology	9230B	Std. Methods	Fecal Streptococci
Wastewater	BTEX	GC/FID	8021B	SW-846	BTEX
Wastewater	General Chemistry	Spectrophotometric	110.1	EPA	Color
Wastewater	General Chemistry	Potentiometric	120.1	EPA	Conductance, Specific
Wastewater	General Chemistry	Titrimetric	130.2	EPA	Hardness (EDTA Total as CaCO3)
Wastewater	General Chemistry	General Chemistry	140.1	EPA	Odor
Wastewater	General Chemistry	Potentiometric	150.1	EPA	pH
Wastewater	General Chemistry	Gravimetric	160.1	EPA	Solids, Total Dissolved (180 C)
Wastewater	General Chemistry	Gravimetric	160.2	EPA	Solids, Total Suspended (103 - 105 C)
Wastewater	General Chemistry	Gravimetric	160.3	EPA	Solids, Total (103 - 105 C)
Wastewater	General Chemistry	Gravimetric	160.3	EPA	Moisture, Percent (%)
Wastewater	General Chemistry	Gravimetric	160.4	EPA	Solids, Total Volatile
Wastewater	General Chemistry	Gravimetric	160.4	EPA	Solids, Volatile Suspended
Wastewater	General Chemistry	Gravimetric	160.5	EPA	Solids, Settleable
Wastewater	General Chemistry	Gravimetric	160.5	EPA	Solids, Settleable
Wastewater	General Chemistry	General Chemistry	170.1	EPA	Temperature
Wastewater	General Chemistry	Turbidimetric	180.1	EPA	Turbidity
Wastewater	General Chemistry	Ion Chromatography (IC)	300.0	EPA	Anions, by IC (Br, PO4, SO4, NO3, NO2,Cl, F)
Wastewater	General Chemistry	Ion Chromatography (IC)	300.1	EPA	Bromate,Chlorite,Chlorate,Bromide
Wastewater	General Chemistry	Titrimetric	305.1	EPA	Acidity
Wastewater	General Chemistry	Titrimetric	310.1	EPA	Alkalinity, (Total, bicarb, carb, hydrox)
Wastewater	General Chemistry	Ion Chromatography (IC)	314.0	EPA	Perchlorate
Wastewater	General Chemistry	Spectrophotometric	335.1	EPA	Cyanide, Amenable to Chlorination
Wastewater	General Chemistry	Spectrophotometric	335.2	EPA	Cyanide, Free
Wastewater	General Chemistry	Potentiometric	340.2	EPA	Fluoride
Wastewater	General Chemistry	Potentiometric	350.3	EPA	Ammonia

Program	Analyte Group	Technique	Method	Source	Description
Wastewater	General Chemistry	Spectrophotometric	351.2	EPA	Nitrogen, Total Kjeldahl (TKN)
Wastewater	General Chemistry	Potentiometric	351.4	EPA	Total Kjeldahl Nitrogen (TKN)
Wastewater	General Chemistry	Potentiometric	360.1	EPA	Oxygen, Dissolved
Wastewater	General Chemistry	Spectrophotometric	365.3	EPA	Phosphate (Ortho)
Wastewater	General Chemistry	Spectrophotometric	376.2	EPA	Sulfide (Methylene Blue)
Wastewater	General Chemistry	Potentiometric	405.1	EPA	BOD5
Wastewater	General Chemistry	Spectrophotometric	410.4	EPA	COD, Automated
Wastewater	General Chemistry	Oxidative Combustion	415.1	EPA	Dissolved Organic Carbon
Wastewater	General Chemistry	Spectrophotometric	420.1	EPA	Phenols, Total
Wastewater	General Chemistry	Spectrophotometric	425.1	EPA	MBAS, Surfactants
Wastewater	General Chemistry	Potentiometric	2580	Std. Methods	Oxidation / Redox Potential
Wastewater	General Chemistry	Potentiometric	9040	SW-846	pH
Wastewater	General Chemistry	Potentiometric	9214	SW-846	Fluoride
Wastewater	General Chemistry	Gravimetric	1664 A	EPA	Oil and Grease
Wastewater	General Chemistry	General Chemistry	2120 B	Std. Methods	Color
Wastewater	General Chemistry	Turbidimetric	2130 B	Std. Methods	Turbidity
Wastewater	General Chemistry	General Chemistry	2150 B	Std. Methods	Odor
Wastewater	General Chemistry	Titrimetric	2310 B	Std. Methods	Acidity
Wastewater	General Chemistry	Titrimetric	2320 B	Std. Methods	Alkalinity, Hydroxide
Wastewater	General Chemistry	Titrimetric	2320 B	Std. Methods	Alkalinity, Total
Wastewater	General Chemistry	Titrimetric	2320 B	Std. Methods	Alkalinity, Bicarbonate
Wastewater	General Chemistry	Titrimetric	2320 B	Std. Methods	Alkalinity, Carbonate
Wastewater	General Chemistry	Calculation	2340 B	Std. Methods	Hardness (by calculation)
Wastewater	General Chemistry	Titrimetric	2340 C	Std. Methods	Hardness, EDTA Total as CaCO3
Wastewater	General Chemistry	Potentiometric	2510 B	Std. Methods	Conductance, Specific
Wastewater	General Chemistry	Gravimetric	2540 B	Std. Methods	Solids, Total (103 - 105 C)
Wastewater	General Chemistry	Gravimetric	2540 C	Std. Methods	Solids, Total Dissolved (180 C)
Wastewater	General Chemistry	Gravimetric	2540 D	Std. Methods	Solids, Total Suspended (103 - 105 C)
Wastewater	General Chemistry	Gravimetric	2540 E	Std. Methods	Solids, Volatile Suspended
Wastewater	General Chemistry	Gravimetric	2540 E	Std. Methods	Solids, Total Volatile

Program	Analyte Group	Technique	Method	Source	Description
Wastewater	General Chemistry	Gravimetric	2540 F	Std. Methods	Solids, Settleable
Wastewater	General Chemistry	Gravimetric	2540 F	Std. Methods	Solids, Settleable
Wastewater	General Chemistry	Gravimetric	2540 G	Std. Methods	Solids, Total Fixed & Volatile
Wastewater	General Chemistry	General Chemistry	2550 B	Std. Methods	Temperature
Wastewater	General Chemistry	Spectrophotometric	3500-Cr D	Std. Methods	Chromium (Hexavalent)
Wastewater	General Chemistry	Spectrophotometric	3500-Fe B	Std. Methods	Ferrous Iron
Wastewater	General Chemistry	Spectrophotometric	4500 S D	Std. Methods	Sulfide
Wastewater	General Chemistry	General Chemistry	4500-Cl G	Std. Methods	Chlorine Residual
Wastewater	General Chemistry	Spectrophotometric	4500-CN C E	Std. Methods	Cyanide, Total (includes distillation method)
Wastewater	General Chemistry	Spectrophotometric	4500-CN G	Std. Methods	Cyanide, Amenable to Chlorination
Wastewater	General Chemistry	Spectrophotometric	4500-CN I	Std. Methods	Cyanide, Weak Acid Dissociable
Wastewater	General Chemistry	Spectrophotometric	4500-CN I	Std. Methods	Cyanide, Weak Acid Dissociable
Wastewater	General Chemistry	Potentiometric	4500-F C	Std. Methods	Fluoride
Wastewater	General Chemistry	Potentiometric	4500-H+B	Std. Methods	pH
Wastewater	General Chemistry	Preparation	4500-NH3 B	Std. Methods	Ammonia, Distillation
Wastewater	General Chemistry	Titrimetric	4500-NH3 C	Std. Methods	Ammonia
Wastewater	General Chemistry	Potentiometric	4500-NH3 D	Std. Methods	Ammonia
Wastewater	General Chemistry	Spectrophotometric	4500-Norg C	Std. Methods	Nitrogen, Total Kjeldahl (TKN), macro
Wastewater	General Chemistry	Potentiometric	4500-O G	Std. Methods	Oxygen, Dissolved
Wastewater	General Chemistry	Potentiometric	5210 B	Std. Methods	CBOD5
Wastewater	General Chemistry	Potentiometric	5210 B	Std. Methods	BOD5
Wastewater	General Chemistry	Spectrophotometric	5220 D	Std. Methods	COD, Closed Reflux
Wastewater	General Chemistry	IR	5310 B	Std. Methods	Total Organic Carbon (TOC), Combustion
Wastewater	General Chemistry	UV/Persulfate Oxidation	5310 C	Std. Methods	Total Organic Carbon (TOC)
Wastewater	General Chemistry	Spectrophotometric	5540 C	Std. Methods	Surfactants (MBAS)
Wastewater	Hydrocarbons	Gravimetric	413.1	EPA	Oil & Grease
Wastewater	Hydrocarbons	IR	413.2	EPA	Oil & Grease
Wastewater	Hydrocarbons	Gravimetric	418.1	EPA	Petroleum Hydrocarbons-IR (TPHC)
Wastewater	Hydrocarbons	Gravimetric	1664 A	EPA	Oil & Grease
Wastewater	Hydrocarbons	GC/FID	CA LUFT	CA LUFT	Gasoline Range Organics (GRO)
Wastewater	Hydrocarbons	GC/FID	CA LUFT	CA LUFT	Diesel Range Organics (DRO) CA LUFT
Wastewater	Metals	Calculation	200.7	EPA	Hardness (calculation from ICP

Program	Analyte Group	Technique	Method	Source	Description
					results)
Wastewater	Metals	ICP	200.7	EPA	Metals, ICP
Wastewater	Metals	ICP/MS	200.8	EPA	Metals, ICP-MS
Wastewater	Metals	Ion Chromatography (IC)	218.6	EPA	Chromium, Hexavalent
Wastewater	Metals	CVAA	245.1	EPA	Mercury, CVAA
Wastewater	Metals	Digestion	3050 B	SW-846	Digestion - Metals, Waters
Wastewater	Metals	Automated, Colorimetric	3500-Fe D	Std. Methods	Ferrous Iron (Konelab)
Wastewater	PCBs	GC/ECD	608_PCB	EPA	PCBs
Wastewater	Pesticides	GC/ECD	608_Pest	EPA	Organochlorine Pesticides
Wastewater	Semivolatile Organics	GC/MS	625	EPA	Semivolatiles
Wastewater	Semivolatile Organics	GC/MS	625	EPA	Polynuclear Aromatic Hydrocarbons (PAHs)
Wastewater	Semivolatile Organics	GC/MS	1625	EPA	Semivolatiles, Isotopic Dilution
Wastewater	Semivolatile Organics	GC/MS	625 mod.	EPA	PAHs GC/MS SIM Low Level
Wastewater	Volatile Organics	GC/MS	624	EPA	Volatiles

ATTACHMENT B

Crimson Pipeline LP
Dominquez SPILL
SAMPLING FIELD DATA SHEET

Date of Sampling:
Arrival Time
Departure Time:

	Sample Type (Reg/Dup/ Trip/Equip)	Sample ID (ZV-XXY-ABB-CC)	Sample Location	Time (24:00)	Latitude	Longitude	Sample Type		Sample Preservation (HCL/None)	Sample Equipment Type	Field Reading (ppmv)	Depth of Sample (bgs)	Comment
							Water/Soil/ Sediment (W/S/M)	Composite/Grab (C/G)					
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													
19													
20													

KEY:							
	Z = Activity Phase	**X = General Location**	DC = Dominguez Channel	**Y = Media**	**A =Sample Point Type**	**BB = Boring Number**	**CC = Sample Depth**
	N = Investigation Phase	FD = French Drain		W = Water	T = Transect		
	C =Confirmation Phase	SL = Shell Lube		S = Soil	H = Hand Auger		
	V or R= Duplicate, Otherwise left blank	YL = Youngstown Lateral	CB = Temp. TB = Trip EB = Equipment Blank	M = Sediment	G = Grab		

Notes:

GPS ID Number:	PID Serial Number:
Personnel on Site:	Field Instrument Calibration completed by
Signature:	Calibration Gas Type: 100 PPMV Isobutylene Pass / Fail

ATTACHMENT C

Irvine
17461 Derian Ave
Suite 100
Irvine, CA 92614
phone 949.261.1022 fax 949.260.3299

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Client Contact	**Project Manager:**	**Site Contact:**	**Date:**	COC No:
Stantec Consulting Corp.	**Tel/Fax:**	**Lab Contact:**	**Carrier:**	_______ of ______ COCs
25864-F Business Center Dr.	**Analysis Turnaround Time**			Job No.
Redlands, CA 92374	Calendar (C) or Work Days (W) __________			
(909) 335-6166 Phone	TAT if different from Below _________			
(909) 335-6120 FAX	☐ 2 weeks			SDG No.
Project Name: Crimson Pipeline LP	☐ 1 week			
Site: Dominguez Channel	☐ 2 days			
P O #	☐ 1 day			

Sample Identification	**Sample Date**	**Sample Time**	**Sample Type**	**Matrix**	**# of Cont.**	**Filtered Sample**																		Sample Specific Notes:

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other ____________

Possible Hazard Identification
☐ *Non-Hazard* ☐ *Flammable* ☐ *Skin Irritant* *Poison B* ☐ *Unknown* ☐

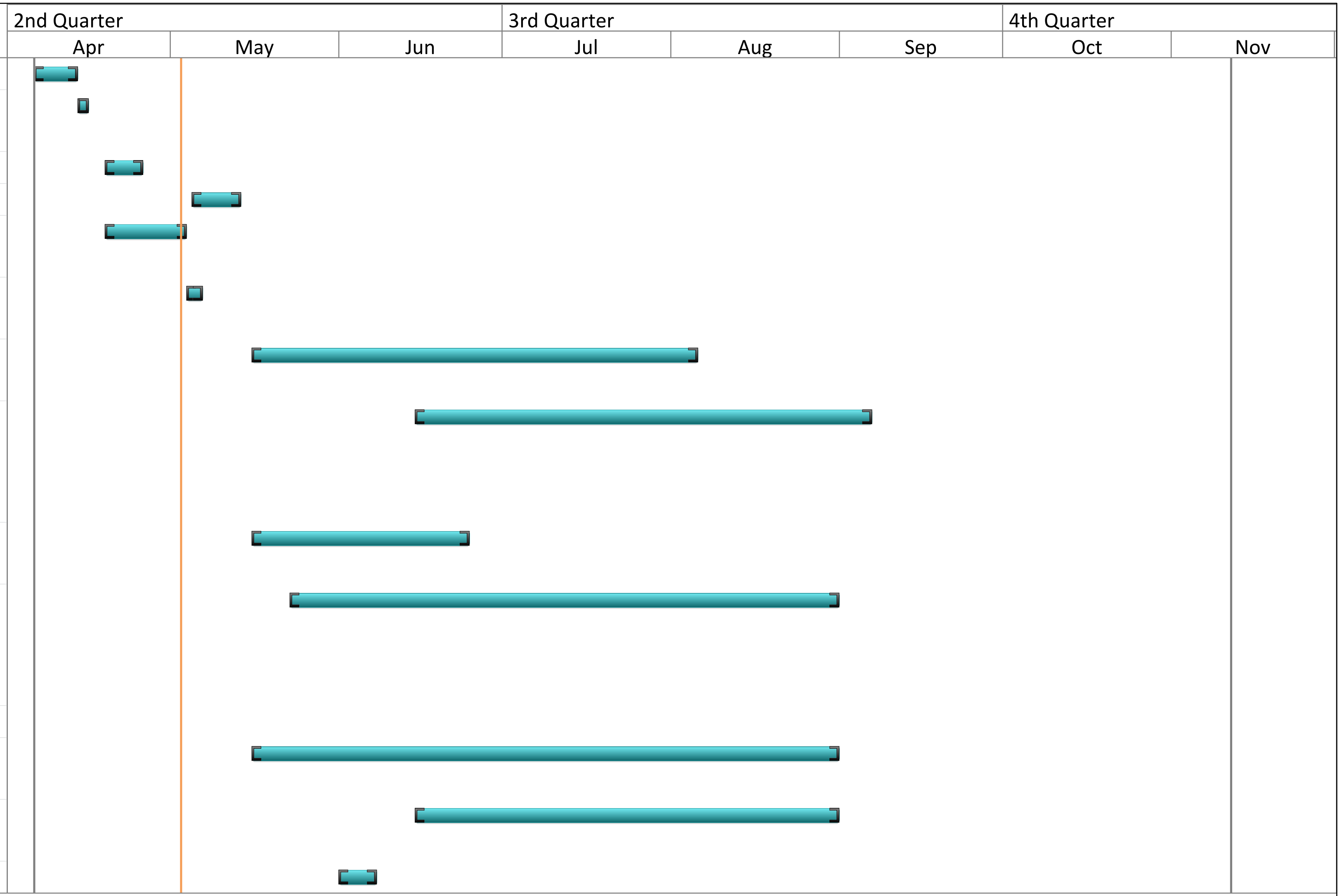
Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For __________ Months*

Special Instructions/QC Requirements & Comments:

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:

APPENDIX C
SCHEDULE

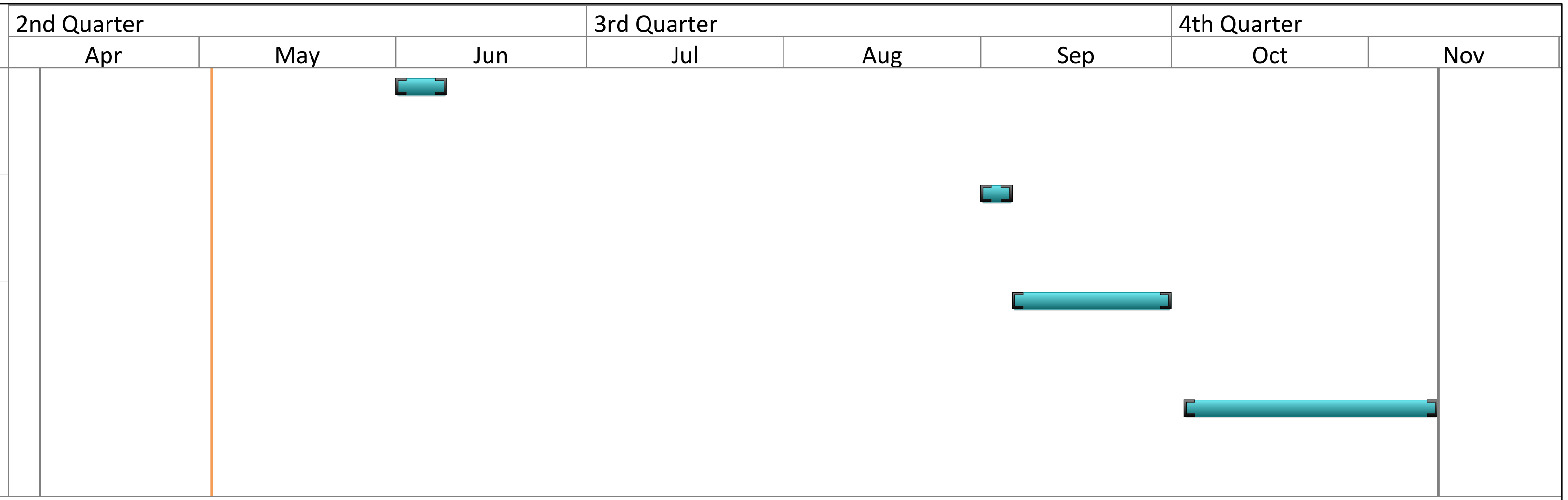
ID		Task Mode	Task Name	Duration	Start	Finish
1			Project Work Plan	6 days	Wed 4/6/11	Wed 4/13/11
2			Work Plan Review - EPA	2 days	Thu 4/14/11	Fri 4/15/11
3			ACTA Data Request	5 days	Tue 4/19/11	Mon 4/25/11
4			ACTA Data Review	7 days	Thu 5/5/11	Fri 5/13/11
5			Prepare/Revise Project Plan	11 days	Tue 4/19/11	Tue 5/3/11
6			Project Plan Review - EPA	3 days	Wed 5/4/11	Fri 5/6/11
7			Conduct Site Assessments	60 days	Mon 5/16/11	Fri 8/5/11
8			Prepare Preliminary Report of Site Assessments - Ongoing	60 days	Wed 6/15/11	Tue 9/6/11
9			Conduct Feasibility for Oil Removal	30 days	Mon 5/16/11	Fri 6/24/11
10			Prepare/Update Work Activity Plan for Oil Removal - Ongoing	73 days	Mon 5/23/11	Wed 8/31/11
11						
12			Implement Oil Removal Plan	78 days	Mon 5/16/11	Wed 8/31/11
13			Treatment System Design	56 days	Wed 6/15/11	Wed 8/31/11
14			Pipeline Removal	5 days?	Wed 6/1/11	Tue 6/7/11



Project: Dominguez Channel Oil S
Date: Tue 5/3/11

Task	External Tasks	Manual Task	Finish-only
Split	External Milestone	Duration-only	Deadline
Milestone	Inactive Task	Manual Summary Rollup	Progress
Summary	Inactive Milestone	Manual Summary	
Project Summary	Inactive Summary	Start-only	

ID		Task Mode	Task Name	Duration	Start	Finish
15			Site Assessment at Youngstown Lateral Area	6 days	Wed 6/1/11	Wed 6/8/11
16			Review Design for Treatment System - EPA	3 days	Thu 9/1/11	Mon 9/5/11
17			Treatment System Permitting and Procurement	19 days	Tue 9/6/11	Fri 9/30/11
18			Treatment System Construction and Installation	30 days	Mon 10/3/11	Fri 11/11/11



Project: Dominguez Channel Oil S
Date: Tue 5/3/11

Task	External Tasks	Manual Task	Finish-only
Split	External Milestone	Duration-only	Deadline
Milestone	Inactive Task	Manual Summary Rollup	Progress
Summary	Inactive Milestone	Manual Summary	
Project Summary	Inactive Summary	Start-only	